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EXAMINER

SHECHTMAN, SEAN P

ART UNIT PAPER NUMBER

2125

DATE MAILED: 03/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/829,436

Applicant(s)

FAIRLIE ET AL.

Examiner

Sean P. Shechtman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25,31-35,37-50,52-66,69-74 and 78-82 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25,31-35,37-50,52-66,69-74 and 78-82 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 09/387,828.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/19/05
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

1. Claims 25, 31-35, 37-50, 52-66, 69-74, and 78-82 are presented for examination. Claims 25, 31-33, 47, 50, 52-56, 58, 61-66, 69, 79, 81, and 82 have been amended.
2. In the response filed July 14th 2005, applicant inadvertently forgot to that the claim listing shall commence on a separate sheet of the amendment document and the sheet(s) that contain the text of any part of the claims shall not contain any other part of the amendment. The title of the invention has been amended to read "Hydrogen Energy System". Any further amendments will be required to comply with 37 CFR 1.121 (c)(1).

Response to Amendment

3. The amendment filed December 29th 2005 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: "user 16 may comprise a hydrogen conversion device such as an internal combustion engine for such a vehicle" (page 17 of the specification); "conversion of hydrogen into electricity via... internal combustion engine" (page 17 of the specification). Applicant is required to cancel the new matter in the reply to this Office Action.

Election/Restrictions

4. Withdrawn in light of the amendment filed December 29th 2005.

Drawings

5. Objections withdrawn in light of the amendment filed December 29th 2005.

Specification

6. Objection withdrawn in light of the amendment.

Claim Objections

7. Claim 31 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 31 appears to require that the control inputs further include data concerning said hydrogen generator, however, claim 25 already requires that the control inputs include data concerning the availability of electrical energy for use by said hydrogen generator. The examiner respectfully submits that the data concerning the availability of electrical energy for use by said hydrogen generator is data concerning the hydrogen generator.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claim 43 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 43 recites the limitation of a hydrogen conversion device that is an internal combustion engine. The original specification and claims provide for a hydrogen conversion device such as a fuel cell, however the original specification and claims fail to provide for a hydrogen conversion device that is an internal combustion engine.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 25, 31-35, 37-50, 52-66, 69-74, and 78-82 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 25, 79, and 82 provides for the use of a hydrogen energy system, but, since the claims do not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claims 25, 50, 52, 54, 55, 62, 64, 66, 82 provides for the use of electrical energy, but, since the claims do not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 31 recites the limitation "said control inputs received and processed by said controller for controlling the generation of hydrogen" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

Claim 32 recites the limitation "said control inputs received and processed by said controller for controlling the generation of hydrogen" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

Claim 33 recites the limitation "said control inputs received and processed by said controller for controlling the generation of hydrogen" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

Claim 66 recites the limitation "said electricity" in line 3. There is insufficient antecedent

basis for these limitations in the claims.

Referring to claim 41, the examiner respectfully submits that it is not clear how a system comprising a vehicle can be for use off-board a vehicle.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

10. Claims 25, 79, and 82 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd. App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

11. Claims 25, 50, 52, 54, 55, 62, 64, 66, 82 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

12. Claims 25, 31-35, 37-44, 47, 57, 58, 66, 71-74, 79, 80, 81, are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 5,346,778 to Ewan et al (hereinafter referred to as Ewan), previously supplied by the examiner.

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Referring to claims 25, 31, 32, 33, 47, 57, 58, 79, Ewan teaches
a hydrogen generator for generating hydrogen by water electrolysis using electrical energy received from a source of electric energy (Fig. 1, element 15; Col. 3, lines 19-20; Col. 7, lines 8-12; Col. 4, lines 55-57);

a hydrogen storage apparatus for storing at least some of the hydrogen generated by said hydrogen generator (Col. 7, lines 14-16; Fig. 1, element 4);

a controller having a computer processor for receiving and processing control inputs (Fig. 2; element 140; Col. 8, lines 15-21);

said control inputs including data concerning the availability of electric energy for use by said hydrogen generator (Col. 9, lines 25-33; Col. 4, lines 35-38), data concerning said hydrogen generator (Col. 8, lines 56-63 and/or Col. 9, lines 10-21), data concerning hydrogen demand (Col. 2, lines 63-68; Col. 8, lines 56-63), and data concerning said hydrogen storage apparatus (Figs. 1 and 2, element 123); and

said controller being operatively connected to said hydrogen generator for controlling the generation of hydrogen based in part on said control inputs including data concerning the availability of electrical energy for use by said hydrogen generator (See Fig. 2, Col. 9, lines 25-33; Col. 8, lines 56-63).

The claims, as such, still do not require that the control of the generation of hydrogen be based on the data concerning the availability of electric energy for use by said hydrogen generator, data concerning said hydrogen generator, data concerning hydrogen demand, and data concerning said hydrogen storage apparatus. In fact, the data is not even required to be the

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availability of electric energy data, hydrogen generation data, hydrogen storage data, hydrogen demand data, or even any energy data.

Ewan clearly teaches the controller controls the closing of the circuit between the voltage regulator and the electrolyzer to use the excess fuel cell power to operate the electrolyzer, if the voltage sensors indicate power load on the fuel cells is not at or above the maximum (Col. 9, lines 25-33). Ewan clearly teaches, and it is commonly known in the art, the operation of the electrolyzer to provide oxygen gas and “concurrently to provide additional hydrogen gas” (Col. 8, lines 56-64; Col. 9, lines 25-33).

Ewan clearly teaches hydrogen is generated for use during peak power intervals (Col. 2, lines 63-68). The examiner respectfully submits that hydrogen generated for use during peak power intervals is a demand for hydrogen for use by a user. Ewan clearly teaches a controller controls the closing of the circuit between the voltage regulator and the electrolyzer to use the excess fuel cell power to operate the electrolyzer to generate this hydrogen for use during peak power intervals, if the voltage sensors indicate power load on the fuel cells is not at or above the maximum. Therefore, the examiner respectfully submits that the voltage sensors indicating power load on the fuel cells is not at or above the maximum, allowing the controller to control the closing of the circuit between the voltage regulator and the electrolyzer to use the excess fuel cell power to operate the electrolyzer to generate hydrogen for use during peak power intervals, is data concerning hydrogen demand. Clearly, the voltage sensor indication is relevant to the operation of the electrolyzer to generate hydrogen for use during peak power intervals.

Referring to claim 34, Ewan teaches the system above, wherein the controller further controls the storage of hydrogen (Fig. 2, element 110; Col. 8, lines 40-47).

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Referring to claims 35, 37, 39, and 80, Ewan teaches the system above, further comprising a compressor for compressing said hydrogen to a minimum desired pressure prior to storage in said hydrogen storage apparatus (Col. 7, lines 25-38, see Fig. 2 element 91).

Referring to claim 38, Ewan teaches the system of claim 35, wherein said controller controls the generation, compression, and storage of hydrogen (Col. 8, lines 15-21).

Referring to claim 40-44, 81, Ewan teaches the system above further comprising a hydrogen delivery system for delivering hydrogen from *at least one of* said hydrogen generator and said hydrogen storage apparatus to a hydrogen user (See Fig. 1, element 59); wherein said hydrogen user is a hydrogen conversion device for powering a vehicle (Col. 5, lines 9-12, the fuel cell).

Referring to claim 66, Ewan teaches the system above, wherein said data concerning the availability of electrical energy for use by said hydrogen generator includes data pertaining to the type of primary energy resources used for producing said electricity (Col. 9, lines 25-33; Col. 4, lines 35-38).

Referring to claim 71, Ewan teaches the system above, wherein said hydrogen storage apparatus comprises at least one container for storing pressurized hydrogen (Fig. 1, element 4).

Referring to claim 72 and 73, Ewan teaches the system as claimed in claim 25 wherein said controller controls the amount and duration of electricity received by said hydrogen generator (Col. 9, lines 25-33; Col. 4, lines 35-38).

Referring to claim 74, Ewan teaches the system above, wherein said controller comprises a plurality of controllers (Fig. 1, at least elements 140 and 94).

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13. Claims 25, 31-34, 40-44, 46, 47, 53, 56, 57, 58, 66, 72-74, 79, 81, 82, are rejected under 35 U.S.C. 102(b) as being anticipated by E.P. Pub. No. 0755088 to Oki (hereinafter referred to as Oki), supplied by applicant.

Referring to claims 25, 31, 32, 33, 46, 47, 53, 56, 57, 58, 79, 82, Oki teaches
a hydrogen generator for generating hydrogen by water electrolysis using electrical energy received from a source of electric energy (Col. 12, lines 45-51);

a hydrogen storage apparatus for storing at least some of the hydrogen generated by said hydrogen generator (Col. 12, lines 51-53);

a controller having a computer processor for receiving and processing control inputs, said control inputs including data concerning the availability of electric energy for use by said hydrogen generator (Col. 13, lines 14-21), data concerning said hydrogen generator (Col. 13, lines 11-12), data concerning hydrogen demand (Col. 13, lines 11-14), and data concerning said hydrogen storage apparatus (Col. 13, lines 12); and

said controller being operatively connected to said hydrogen generator for controlling the generation of hydrogen based in part on said control inputs including data concerning the availability of electrical energy for use by said hydrogen generator (Col. 5, lines 25-45); wherein said data concerning the availability of electrical energy for use by said hydrogen generator includes data concerning the price of electrical energy (Col. 13, lines 21-28).

The claims, as such, still do not require that the control of the generation of hydrogen be based on the data concerning the availability of electric energy for use by said hydrogen generator, data concerning said hydrogen generator, data concerning hydrogen demand, and data concerning said hydrogen storage apparatus. In fact, the data is not even required to be the

availability of electric energy data, hydrogen generation data, hydrogen storage data, hydrogen demand data, or even any energy data.

Referring to claim 34, Oki teaches the system above, wherein the controller further controls the storage of hydrogen (Col. 5, lines 43-45).

Referring to claim 40-44, 81, Oki teaches the system above further comprising a hydrogen delivery system for delivering hydrogen from *at least one of* said hydrogen generator and said hydrogen storage apparatus to a hydrogen user, wherein said hydrogen user is a hydrogen conversion device for powering a vehicle (Col. 3, lines 37-45).

Referring to claim 66, Oki teaches the system above, wherein said data concerning the availability of electrical energy for use by said hydrogen generator includes data pertaining to the type of primary energy resources used for producing said electricity (Col. 5, lines 1-16).

Referring to claim 72 and 73, Oki teaches the system as claimed in claim 25 wherein said controller controls the amount and duration of electricity received by said hydrogen generator (Col. 5, lines 16-45).

Referring to claim 74, Oki teaches the system above, wherein said controller comprises a plurality of controllers (Fig. 1, Col. 6, lines 9-24).

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

14. Claims 45, 46, 48, 49, 54, 59-63, are rejected under 35 U.S.C. 103(a) as being unpatentable over Ewan as applied to claims 25, 31-35, 37-44, 47, 57, 58, 66, 71-74, 80, 81,

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above, and further in view of U.S. Pat. No. 5,592,028 to Pritchard (hereinafter referred to as Pritchard).

Referring to claims 45, 46, 48, 49, 54, 59-63, Ewan teaches a source of electric energy includes a non-grid source of electric energy and the controller selects a source of electrical energy based on data including said data concerning the availability of electrical energy for use by said hydrogen generator (Col. 9, lines 25-33; Col. 4, lines 35-38); the system comprising a device for converting hydrogen into electricity (Col. 5, lines 9-12, the fuel cell).

Referring to claim 45, Ewan teaches all of the limitations set forth above, however fails to teach a hydrogen conversion device for receiving hydrogen from *at least one of* said hydrogen generator and said hydrogen storage apparatus and converting said hydrogen into thermal energy.

Referring to claim 46, Ewan teaches all of the limitations set forth above, however fails to teach said source of electric energy includes an electricity grid.

Referring to claims 48 and 59, Ewan teaches all of the limitations set forth above, however fails to teach said primary energy resources include renewable resources.

Referring to claims 49 and 61, Ewan teaches all of the limitations set forth above, however fails to teach said primary energy resources include *at least one of the following*: fossil fuels, wind, solar, nuclear and hydro.

Referring to claim 54, Ewan teaches all of the limitations set forth above, however fails to teach said controller modulates the generation of hydrogen by said hydrogen generator based on data including said energy source data.

Referring to claim 60, Ewan teaches all of the limitations set forth above, however fails to teach said renewable resources include *at least one of* wind, solar, and hydro.

Referring to claim 62, Ewan teaches all of the limitations set forth above, however fails to teach a source of electric energy includes an electricity grid.

However, Pritchard teaches analogous art (whole document), wherein Pritchard teaches a hydrogen energy system comprising: (a) a hydrogen generator for generating hydrogen from electricity received from a source of electric energy (Col. 4, lines 59-61); and (b) a controller for processing data concerning said source of electric energy (Col. 3, lines 38-42).

Referring to claim 45, Pritchard teaches the system further comprising a hydrogen conversion device for receiving hydrogen from *at least one of* said hydrogen generator and said hydrogen storage apparatus and converting said hydrogen into thermal energy (Col. 6, claim 4).

Referring to claim 46, Pritchard teaches the system wherein said source of electric energy includes an electricity grid (Fig. 1, element 3; Col. 2, lines 56-59).

Referring to claims 48 and 59, Pritchard teaches the system wherein said primary energy resources include renewable resources (wind farm, Col. 2, line 57).

Referring to claims 49 and 61, Pritchard teaches the system wherein said primary energy resources include *at least one of the following*: fossil fuels, wind, solar, nuclear and hydro (wind farm, Col. 2, line 57).

Referring to claim 54, Pritchard teaches the system wherein said controller modulates the generation of hydrogen by said hydrogen generator based on data including said energy source data (Col. 3, line 59 – Col. 4, line 8, 1.6 volts to 1.58 volts).

Referring to claim 60, Pritchard teaches the system wherein said renewable resources include *at least one of* wind, solar, and hydro (wind farm).

Referring to claim 62, Pritchard teaches a source of electric energy includes an electricity grid and at least one non-grid source of electric energy (Col. 2, lines 32-62).

Therefore, it would have been obvious to one of ordinary skill in the art at the time that the invention was made to combine the teachings of Pritchard with the teachings of Ewan. One of ordinary skill in the art would have been motivated to combine these references because Pritchard teaches an invention that allows for much longer periodic smoothing of the wind energy availability curve. The result of this is to allow a more reliable design for wind farms based upon seasonal or annual mean wind speed figures. Indeed the invention will permit, in principle, wind energy to contribute up to a 100% of total grid power, limited only by the total energy available in the local wind regime. All electrolysis products are initially put into the various storage means, and the electrolysis plant is made capable of accepting any power input up to the maximum rated, power of the wind plant. This can greatly simplify the design of the wind energy conversion plant as complex electro/mechanical output control is unnecessary. The wind farm could be designed to produce DC, and therefore hydrogen, at all times and may never have a direct connection to the grid. The invention can be made ecologically neutral by employing hydrogen combustion in stoichiometric quantities with oxygen. Furthermore, the invention does not contribute to the "greenhouse" effect and enhances the ability of wind farms to reduce total atmospheric carbon emissions (Col. 4, lines 34-54).

15. Claims 53, 55, 56, 64, 65, 82, are rejected under 35 U.S.C. 103(a) as being unpatentable

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over Ewan or Ewan/ Pritchard as applied to the claims above, and further in view of U.S. Pat. No. 5,432,710 to Ishimaru et al (hereinafter referred to as Ishimaru), supplied by the applicant.

Referring to claims 53, 55, 56, 64, 65, 82, Ewan or Ewan/ Pritchard teaches all the limitations set forth above however, Ewan or Ewan/ Pritchard fails to teach the controller modulates the generation of electricity by the hydrogen conversion device based on data including energy availability data, wherein at least some of the electricity generated by the hydrogen conversion device is transmitted to the electricity grid; wherein said data concerning the availability of electrical energy for use by said hydrogen generator includes data concerning the price of electrical energy.

However, referring to claims 53, 55, 56, 64, 65, 82 Ishimaru teaches analogous art (whole document), wherein the controller modulates the generation of electricity by the hydrogen conversion device based on data including energy availability data, wherein at least some of the electricity generated by the hydrogen conversion device is transmitted to the electricity grid, wherein said data is transmitted to said controller using the same wires that are used to deliver said electricity (Fig. 1; Col. 7, line 60 – Col. 8, line 58; Col. 10, lines 14-41; Col. 17, lines 27-39); wherein said data concerning the availability of electrical energy for use by said hydrogen generator includes data concerning the price of electrical energy (Col. 18, lines 13-34).

Therefore, it would have been obvious to one of ordinary skill in the art at the time that the invention was made to combine the teachings of Ishimaru with the teachings of Ewan or Ewan/ Pritchard. One of ordinary skill in the art would have been motivated to combine these references because Ishimaru teaches an energy supply system which makes effective use of energy and takes preservation of the environment into account from a consumers' standpoint as

well as a national point of view (Col. 1, lines 65 – Col. 2, line 2). The in-system heat generating means is operable to supply heat in the event of a regular or temporary increase in the heat demand, and this allows the in-system power generating means to have a reduced size, thereby enabling an economical system design and operation. The heat generated by the in-system heat generating means is used when the heat demand increases temporarily and the heat load of the heat consuming installation exceeds the quantity of heat available from the in-system power generating means and this is economical in that a small in-system power generating device is sufficient, instead of necessitating an in-system power generating means capable of meeting a maximum heat demand. The system may be optimized from economic and national points of view also where the energy consumer has a consuming installation which directly uses a combustible gas as a heat source. Where the energy consumer has an energy consuming installation adapted to use power, heat and combustible gas, an optimal amount of operation of the in-system power generating means may be computed after determining a priority order of use. The in-system power generating means is operated in the computed optimal amount and the energy consuming installations of the energy consumer are driven under this condition and under central control (a local control being possible where little load variation occurs). Thus, the optimization may include the energy consuming installations adapted to use power and heat as well (Col. 3, lines 1-51). Furthermore, Ishimaru teaches setting and operation controls allowed to be effected from a remote location, thereby controlling the system in a subtle and precise manner for its optimal condition (Col. 1, lines 40-43).

16. Claims 69, 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ewan as

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applied to claims 33 and 29 above, and further in view of U.S. Pat. No. 5,817,157 to Checketts (hereinafter referred to as Checketts), supplied by applicant.

Referring to claims 69, 70, Ewan teaches all the limitations set forth above, however, Ewan fails to teach the controller initiates operation of the hydrogen generator to generate hydrogen when the amount of hydrogen stored in the hydrogen storage apparatus falls below a predetermined amount, wherein said hydrogen storage chamber comprise a hydride storage chamber.

However, referring to claim 69, 70, Checketts teaches analogous art (whole document), wherein a controller further processes data concerning the hydrogen storage apparatus, wherein the controller initiates operation of the hydrogen generator to generate hydrogen when the amount of hydrogen stored in the hydrogen storage apparatus falls below a predetermined amount, wherein said hydrogen storage chamber comprise a hydride storage chamber (Col. 8, lines 37-55; Col. 17, lines 1-11; Col. 9, lines 1-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time that the invention was made to combine the teachings of Checketts with the teachings of Ewan. One of ordinary skill in the art would have been motivated to combine these references because Checketts teaches a portable fuel source (Col. 3, lines 38-40) and computer system that keeps track of the cells that have not been chemically reacted and will project the number of cells that are needed to be reacted to restore the tank pressure to within a desired range (Col. 4, lines 32-41).

17. Claims 50, 52, 53, 82, are rejected under 35 U.S.C. 103(a) as being unpatentable over

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Ewan as applied to claim 25 above, and further in view of U.S. Pat. No. 6,102,958 to Meystel et al (hereinafter referred to as Meystel), supplied by the examiner.

Referring to claims 50, 52, 53, 82, Ewan teaches all the limitations set forth above, however, Ewan fails to teach data concerning the availability of electrical energy for use by said hydrogen generator includes real time data, stored data, data concerning the price of electrical energy.

However, referring to claims 50, 52, 53, 82, Meystel teaches analogous art (whole document), wherein data concerning the availability of electrical energy for use by said hydrogen generator includes real time data, stored data, energy cost data, data concerning the price of electrical energy (Col. 20, lines 63 – Col. 21, lines 8; Col. 22, lines 1 – Col. 23, lines 15; Col. 26, lines 14-40; Fig. 2; Col. 12, line 31 – Col. 14, line 61).

Therefore, it would have been obvious to one of ordinary skill in the art at the time that the invention was made to combine the teachings of Meystel with the teachings of Ewan. One of ordinary skill in the art would have been motivated to combine these references because Meystel teaches a multi-resolutional decision support system that determines optimal controls using multi-resolutional analysis of acquired data, wherein a knowledge base is created to be searched for optimal controls (Abstract).

18. Claims 50, 52, 53, 78, 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ewan as applied to claim 25 above, and further in view of U.S. Pat. No. 5,818,725 to McNamara et al (hereinafter referred to as McNamara), supplied by the examiner.

Referring to claims 50, 52, 53, 78, 82, Ewan teaches all the limitations set forth above,

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however, Ewan fails to teach energy availability data includes real time data, stored data, energy cost data, data is transmitted to controller by wireless transmission, data concerning the price of electrical energy.

However, referring to claims 50, 52, 53, 78, 82, McNamara teaches analogous art (whole document), wherein energy availability data includes real time data, stored data, energy cost data, data is transmitted to controller by wireless transmission, data concerning the price of electrical energy (Col. 7-8, claims 10, 14; Col. 6, lines 44-53; Col. 2, lines 32-42).

Therefore, it would have been obvious to one of ordinary skill in the art at the time that the invention was made to combine the teachings of McNamara with the teachings of Ewan. One of ordinary skill in the art would have been motivated to combine these references because McNamara teaches a communications channel that allows for the collection and transmission of user demand requirements and control of user demand services (Col. 1; lines 35-44), wherein distributed networks connect to central computer systems via high-speed digital lines and permits automatic meter reading and remote services (Col. 2, lines 23-42).

Response to Arguments

19. Applicant's arguments filed December 29th 2005 have been fully considered but they are not persuasive.

In response to applicant's arguments, the recitation a hydrogen energy system for used off-board a vehicle has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural

limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Applicant argues that the system of Ewan generates its own electrical energy for powering the electrolyzer rather than using electrical energy received from at least one source of energy. The examiner respectfully disagrees. The examiner respectfully submits that the system of Ewan that generates its own electrical energy for powering the electrolyzer is using electrical energy received from at least one source of energy.

Applicant argues that Ewan fails to teach that hydrogen is not stored. The examiner respectfully disagrees. Ewan clearly teaches oxygen and hydrogen from the electrolyzer are “passed to their respective storage tanks 9, 4” (Col. 7, lines 13-16). The examiner respectfully submits that the passing of hydrogen to hydrogen storage tank 4 is storing the hydrogen.

Referring to claims 45, 46, 48, 49, 54, 59-63, in response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Pritchard teaches an invention that allows for much longer periodic smoothing of the wind energy availability curve. The result of this is to allow a more reliable design for wind farms based upon seasonal or annual mean wind speed figures. Indeed the invention will permit, in principle, wind energy to contribute up to a 100% of total grid power, limited only by the total energy available in the local wind regime. All

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electrolysis products are initially put into the various storage means, and the electrolysis plant is made capable of accepting any power input up to the maximum rated, power of the wind plant. This can greatly simplify the design of the wind energy conversion plant as complex electro/mechanical output control is unnecessary. The wind farm could be designed to produce DC, and therefore hydrogen, at all times and may never have a direct connection to the grid. The invention can be made ecologically neutral by employing hydrogen combustion in stoichiometric quantities with oxygen. Furthermore, the invention does not contribute to the "greenhouse" effect and enhances the ability of wind farms to reduce total atmospheric carbon emissions (Col. 4, lines 34-54).

Referring to claims 53, 55, 56, 64, 65, 82, in response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Ishimaru teaches an energy supply system which makes effective use of energy and takes preservation of the environment into account from a consumers' standpoint as well as a national point of view (Col. 1, lines 65 – Col. 2, line 2). The in-system heat generating means is operable to supply heat in the event of a regular or temporary increase in the heat demand, and this allows the in-system power generating means to have a reduced size, thereby enabling an economical system design and operation. The heat generated by the in-system heat generating means is used when the heat demand increases

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temporarily and the heat load of the heat consuming installation exceeds the quantity of heat available from the in-system power generating means and this is economical in that a small in-system power generating device is sufficient, instead of necessitating an in-system power generating means capable of meeting a maximum heat demand. The system may be optimized from economic and national points of view also where the energy consumer has a consuming installation which directly uses a combustible gas as a heat source. Where the energy consumer has an energy consuming installation adapted to use power, heat and combustible gas, an optimal amount of operation of the in-system power generating means may be computed after determining a priority order of use. The in-system power generating means is operated in the computed optimal amount and the energy consuming installations of the energy consumer are driven under this condition and under central control (a local control being possible where little load variation occurs). Thus, the optimization may include the energy consuming installations adapted to use power and heat as well (Col. 3, lines 1-51). Furthermore, Ishimaru teaches setting and operation controls allowed to be effected from a remote location, thereby controlling the system in a subtle and precise manner for its optimal condition (Col. 1, lines 40-43).

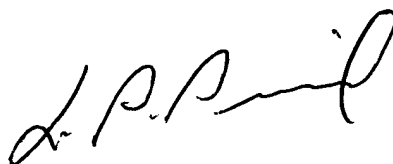
Regarding the Meystel and McNamara references, applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Conclusion

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sean P. Shechtman whose telephone number is (571) 272-3754. The examiner can normally be reached on 9:30am-6:00pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo P. Picard can be reached on (571) 272-3749. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



SPS

Sean P. Shechtman

February 27, 2006

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